and the contents of nitrogen contained in the diffusion preventing layer 68 were 22 atom %, 37 atom %, 50 atom %, and 56 atom %, respectively. Furthermore, the contents of oxygen contained in the diffusion preventing layers 67 and 68 were 4 atom %, 5 atom %, 6 atom %, and 7 atom %, respectively. The oxygen was contained because impurity oxygen present in the chamber was absorbed in the layers. The ratios of nitrogen and oxygen were analyzed by RBS (Rutherford Backscattering Spectroscopy).

G1 cont.

In the Claims

Please amend claims 1, 31, 50, and 54, cancel claims 8, 10, 28, and 55 without prejudice, and add claims 76 and 77, as indicated herein.

1. (Three Times Amended) An optical information recording medium comprising a substrate and a multilayer film, the multilayer film comprising:

a barrier layer;

a first protective layer that comprises sulfur; and

a recording layer generating a reversible phase-change which can be optically detected according to an irradiation of an energy beam;

G2 wherein said barrier layer is formed between said first protective layer and said recording layer and in contact with said first protective layer and said recording layer, and includes one selected from the group consisting of GeXN and GeXNO, where X is at least one element selected from the group consisting of Al, B, Ba, Bi, C, Ca, Ce, Cr, Dy, Eu, Ga, Hf, In, K, La, Mn, Nb, Ni, Pb, Pd, Si, Sn, Ta, Ti, V, W, Yb, Zn, and Zr, and

wherein the content of X to the total content of Ge and X in said barrier layer is 10 to 40 atom %, and the content of N in said barrier layer is 40 atom % or more.

31. (Four Times Amended) A method of recording/erasing/reproducing optical information, comprising the steps of:

providing an optical information recording medium comprising a substrate and a multilayer film, the multilayer film comprising a recording layer generating a reversible phase-change which can be optically detected according to an irradiation of an energy beam, a barrier layer, and a protective layer that comprises sulfur;

G3

recording a signal to said recording layer by irradiating said recording layer with a modulated laser beam erasing a signal recorded on said recording layer by irradiating said recording layer with a laser beam having a predetermined power level;

reproducing a signal recorded on said recording layer by irradiating a laser beam to said recording layer and detecting a light strength of a reflection light or a transmitted light from said recording layer;

G3 cont. wherein said barrier layer is formed between said protective layer and said recording layer and in contact with said protective layer and said recording layer, and includes one selected from the group consisting of GeXn and GeXNO, where X is at least one element selected from the group consisting of Al, B, Ba, Bi, C, Ca, Ce, Cr, Dy, Eu, Ga, Hf, In, K, La, Mn, Nb, Ni, Pb, Pd, Si, Sn, Ta, Ti V, W, Yb, Zn, and Zr, and

wherein the content of X to the total content of Ge and X is said barrier layer is 10 atom % to 40 atom %, and the content of N in said barrier layer is at least 40 atom %.

50. (Four Times Amended) An optical information recording medium comprising a substrate and a multilayer film, the multilayer film comprising phase-change recording layer having reversibly changeable optical characteristics and a Ge-containing layer comprising one selected from the group consisting of GeXN and GeXON as a main component, and a protective layer comprising sulfur, wherein the Ge-containing layer is formed between the phase-change recording layer and the protective layer,

G4 wherein X is at least one element selected from the group consisting of elements belonging to Groups IIIa, IVa, Va, VIa, VIIa, VIII, Ib and IIb and carbon, and

wherein the content of X to the total content of Ge and X in said Ge-containing layer is 10 atom % to 40 atom %, and the content of N in said Ge-containing layer is at least 40 atom %.

54. (Amended) The optical information recording medium according to claim 52, wherein the first Ge-containing layer has a composition represented by $(Ge_{1-m}X_m)_aO_bN_c$ ($0.1 \leq m \leq 0.4$, $a > 0$, $b \geq 0$, $c > 0$, $a + b + c = 100$), and the second Ge-containing layer has a composition represented by $(Ge_{1-n}X_n)_dO_eN_f$ ($0 < n < 1$, $d > 0$, $e \geq 0$, $f > 0$ $d + e + f = 100$), and the following inequality is satisfied: $m < n$.

G5

76. (New) An optical information recording medium comprising a substrate and a multilayer film, the multilayer film comprising:

a barrier layer;

a first protective layer that comprises sulfur; and

a recording layer generating a reversible phase-change which can be optically detected according to an irradiation of an energy beam;

wherein said barrier layer is formed between said first protective layer and said recording layer and in contact with said first protective layer and said recording layer, and includes GeXNO, where X is at least one element selected from the group consisting of Al, B, Ba, Bi, C, Ca, Ce, Cr, Dy, Eu, Ga, Hf, In, K, La, Mn, Nb, Ni, Pb, Pd, Si, Sn, Ta, Ti, V, W, Yb, Zn and Zr, and

wherein the content of X to the total content of Ge and X in said barrier layer is 5 atom % to 40 atom %.

G6

77. (New) An optical information recording medium comprising a substrate and a multilayer film, the multilayer film comprising phase-change recording layer having reversibly changeable optical characteristics and a Ge-containing layer comprising GeXQN as a main component,

wherein X is at least one element selected from the group consisting of elements belonging to Groups IIIa, IVa, Va, VIa, VIIa, VIII, Ib and IIb and carbon, and

wherein the content of X to the total content of Ge and X in said Ge-containing layer is 5 atom % to 40 atom %.